

**AMENDMENTS TO THE CLAIMS**

**Claim 1 (Currently amended):** A method of controlling the crystalline structure of ingots and castings of ferrous and non-ferrous metals, in which a melt is crystallized in helically traveling magnetic fields excited by m-phase systems of alternating currents, the method comprising:

providing inductors positioned around a metal melt;

applying a—train—of m-phase systems of alternating hierarchically frequency- and amplitude- modulated currents (hereinafter SuperWaves) modulated in a superwave pattern to the inductors positioned around the melt to excite hierarchically frequency- and amplitude- modulated helically traveling magnetic fields in the melt.

**Claim 2 (Currently amended):** A method of controlling the crystalline structure according to claim 1, wherein said m-phase systems of alternating currents (SuperWaves) are periodically switched on for a certain time interval and switched off with a certain time interval.

**Claim 3 (Currently amended):** A method of controlling the crystalline structure according to claim 1 or 2, wherein amplitude modulation depth and frequency deviation (SuperWaves parameters) of each pulse in the cluster of pulses are periodically changed in time.

**Claim 4 (Currently amended):** A method of controlling the crystalline structure according to claim 1 or 2, wherein amplitude depth and frequency deviation of each pulse in the cluster of pulses are increased grow with increasing thickness of the crystallizing solid phase.

**Claims 5-31 (canceled)**